that shorter exposures or smaller telescopes may be used), and may facilitate differentiating an object from the random fluctuations of its background. McGee points out that some of the advantages of photoelectronic techniques relative to photographic are their linearity, conversion efficiency, and increased bandwidth; they are more versatile in that electromagnetic deflection techniques can compensate for motions of the instrument, and that uniform background noise can be subtracted electronically. The fact that a photocell is practically linear, and that it can be calibrated and used repeatedly, introduces marked simplifications in data reduction; the disadvantage that it measures but one quantity at a time may be overcome by using television tubes and scanning techniques.

The next chapter contains nine papers on resolution problems and scintillation, and Chapter 6 consists of six papers dealing with wide-angle optical systems and aspheric surfaces. The five papers of the final chapter are on filter photography and thin films.

The papers are on the whole quite readable, and both the longer surveys and shorter summaries are well enough documented to enable the reader to follow up particular topics. The fact that much of the material would not have been regarded as "optics" even ten years ago, and the variety and scope of the papers, indicate the vitality of this field. The developments in photoelectronic techniques are particularly noteworthy; Kopal indicates that the 200-inch Hale telescope using one of McGee's image-storage tubes would extend the limits of observable space to those that could be reached by a 2000-inch telescope using existing photographic techniques.

The History of Mathematics. By Joseph E. Hofmann. Translated by F. Gaynor and H. O. Midonick. 132 pp. Philosophical Library, Inc., New York, 1957. $4.75. *Reviewed by Robert T. Beyer, Brown University.*

In 1951, Oskar Becker and Joseph Hofmann wrote a *History of Mathematics* (*Geschichte der Mathematik*) in which Professor Becker treated the contributions of the Greeks and the Romans, while Professor Hofmann covered mathematical developments in the Near and Far East, and in medieval and modern Europe. In 1953, a slighter volume appeared, due to Hofmann alone, in which the principal emphasis was placed on the High Middle Ages and Early Baroque periods of Western history (1100–1600). It is this latter volume that has now been translated in the Philosophical Library series.

In a sense, the choice is somewhat unfortunate, since the Becker-Hofmann work is a more complete history. The Hofmann original, which appeared as a member of the *Sammlung Göschen* series of texts, bore a label of Volume I, and suggested a future completion of the work. No such label appears on the English translation so that the title of the book becomes misleading.

Two features of the German text have been omitted from the translation: references for further reading at the end of each chapter and a very detailed bibliography of source material as part of the index. These features raised the German edition to the level of a valuable source reference for anyone interested in the field. Their omission in the translation alters the nature of the work to that of a popular and terminal presentation.

In this latter role, the book is handicapped by its precise and rather advanced mathematical style, difficulties that are not made any easier by occasional lapses into Germanic word order on the part of the translators, especially in the earlier portions of the work.

One cannot avoid comparing the book with the history written by Profesor Dirk Struik. The Becker-Hofmann volume, or a Hofmann treatise extended into modern times through a second volume, would provide excellent competition for Struik's book. The actual English edition falls far short of such competition, especially in view of its relatively high price.

After having made so many critical remarks, the reviewer should point out that the coverage of the period 1100–1600 is an outstanding one, and that the book can serve as a useful reference for mathematics of this period.

Semiconductor Surface Physics: Proceedings of the Conf. on the Physics of Semiconductor Surfaces (Philadelphia, Pa., June 1956). Edited by R. H. Kingston. 413 pp. U. of Pennsylvania Press, Philadelphia, Pa., 1957. $8.00. *Reviewed by Joseph G. Hoffman, Roswell Park Memorial Institute.*

Twenty-three technical papers, nine of which have accompanying discussions, present the work of forty-two contributors and new data about semiconductor surfaces. While germanium and lead sulfide are the semiconductors about which most of the experiments center, the results are suggestive and raise questions about surface phenomena in many other kinds of materials.

There are four main subdivisions of the subject in this book as follows: I, Clean Surfaces (2 papers); II, Real Surfaces (11 papers); III, Adsorption and Catalysis (4 papers); and IV, Oxidation (5 papers). The clean surfaces are on germanium. They are examined for their electrical properties, and are explored by electron diffraction with and without gas (oxygen and hydrogen) covering. Real surfaces are studied for field effect, photo effect, inversion layers, velocity of relaxation processes, and 1/f noise. Two of the papers on real surfaces deal with lead sulfide in the forms of photoconductive films and cleaved crystals. Adsorption and catalytic processes are examined where gas reactions occur and space charge boundary layers form on the surface, or, in another direction, where the photo effect plays a role in catalysis. Chemisorption is examined for the role it plays in long time changes in surface work function which can be induced by exposure to light or electrostatic fields. Oxidation of metals is discussed with emphasis on the nucleation theory.

While it is not possible to mention here all the contributors and their many experiments, it can be said